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Education

Ph.D. Energy and Resources, University of California, Berkeley, 1994
M.S. Energy and Resources, University of California, Berkeley, 1990
B.S. Conservation and Resource Studies, Highest Honors, University of California, Berkeley, 1984

Professional Positions

Program Head, Climate and Carbon Sciences, Lawrence Berkeley National Lab, 2001-present
Associate Adjunct Professor, Energy and Resources, U.C. Berkeley, 2005-present
Staff Scientist, Earth Science Division, Lawrence Berkeley National Laboratory, 2005-present
Scientist, Earth Science Division, Lawrence Berkeley National Laboratory, 1998-2005
Post-Doctoral Fellow, U.C. Irvine and Stanford University 1994-1998
Graduate Research Assistant, Energy and Resources Group, U.C. Berkeley 1986-1994
Research Principal Investigator, Rocky Mountain Biological Laboratory, Colorado 1991-93
Science Intern, Lawrence Livermore National Laboratory 1985-1986

Fellowships and Honors

Secretary of Energy Outstanding Mentor Award 2008
Kavli Fellow of the National Academy of Sciences
Presidential Early Career Award for Scientists and Engineers, 2003
DOE Early Career Award for Scientists and Engineers, 2003
Earth System Science Post-Doctoral Fellowship, 1994-1997
NASA Global Change Doctoral Fellowship, 1991-94
Switzer Environmental Fellowship, 1990-92
Graduate Opportunity Fellowship, U.C. Berkeley, 1986-87

Peer-reviewed Publications (**indicates student or post doc*)

Riley, W.J., J.B. Gaudinski, M.S. Torn, J.D. Joslin, and P.J. Hanson. Fine root mortality rates in a temperate forest: estimates using radiocarbon data and numerical modeling. In press, *New Phytologist*.

St.Clair, S.B., E. Sudderth, C. Castanha, M.S. Torn, and D. Ackerly. 2009. Plant responsiveness to soil moisture and nitrogen is consistent across the functional diversity of a California annual grassland. In press, *Journal of Vegetation Science*.

Still, C.J., Riley, W.J., Biraud, S.C., Noone, D.C., Buenning, N.H., Randerson J.T., Farquhar G.D., Torn M.S., and J.A. Berry. 2009. The influence of clouds and diffuse radiation on ecosystem-atmosphere CO₂ and C¹⁸OO exchanges. *Journal of Geophysical Research – Biogeosciences* 114, G01018, doi:10.1029/2007JG000675.

St.Clair*, S.B., E. Sudderth, M.L. Fischer, M.S. Torn, S. Stuart, R. Salve, D. Egget, and D. Ackerly. 2009. Variation in soil moisture and N availability modulates carbon and water exchange in a California grassland experiment. *Global Change Biology*. doi: 10.1111/j.1365-2486.2009.01862.x

Gaudinski*, J.B., M.S. Torn, W.J. Riley, C. Swanston*, S.E. Trumbore, J.D. Joslin, H. Majdi, T.E. Dawson, and P.J. Hanson. 2009. The use of stored carbon reserves in growth of temperate tree

- roots and leaf buds: analyses using radiocarbon measurements and modeling. *Global Change Biology* 15:992–1014.
- Hammes*, K., M.S. Torn, A.G. Lapenas and M.W.I. Schmidt. 2008. Centennial black carbon turnover observed in a Russia steppe soil. *European Biogeosciences Journal*, [bg-5-1339-2008.html](#)
- Xiao, Jingfeng, Q. Zhuang, D.D. Baldocchi, B.E. Law, A.D. Richardson, J. Chen, R. Oren, G. Starr, A. Noormets, S. Ma, S.B. Verma, S. Wharton, S.C. Wofsy, P.V. Bolstad, S.P. Burns, D.R. Cook, P.S. Curtis, B.G. Drake, M. Falk, M.L. Fischer, D.R. Foster, L. Gu, J.L. Hadley, D.Y. Hollinger, G.G. Katul, M. Litvak, T.A. Martin, R. Matamala, S. McNulty, T.P. Meyers, R.K. Monson, J.W. Munger, W.C. Oechel, K.T. Paw U, H.P. Schmid, R.L. Scott, G. Sun, A.E. Suker, M.S. Torn. 2008. Estimation of Net Ecosystem Carbon Exchange for the Conterminous United States by Combining MODIS and AmeriFlux Data. *Agricultural and Forest Meteorology* 148:1827-1847, doi:10.1016/j.agrformet.2008.06.015
- Harden, J.W., A.A. Berhe*, M.S. Torn, J. Harte, S. Liu, and R.F. Stallard. 2008. Soil Erosion: Data Say C Sink. Letter. *Science* 11 April 2008: 178-179.
- Lapenis A.G., G.B. Lawrence, S. Baily, B.F. Aparin, A.I. Shiklomanov, N.A. Speranskaya, M.S. Torn, M. Calef. 2008. Climatically driven loss of calcium in steppe soil as a sink for atmospheric carbon. *Global Biogeochemical Cycles*, V22, GB2010, doi:10.1029/2007GB003077.
- Bird*, J.A., M.A. Kleber, and M.S. Torn. 2008. ¹³C and ¹⁵N stabilization dynamics in soil organic matter fractions during needle decomposition. *Organic Geochemistry*, 39(4): 465-477
- Fried, J.S., J.K. Gillespie, W.J. Riley, T.J. Moody, C. Simon de Blas, K. Hayhoe, M. Moritz, S. Stephens, M.S. Torn. 2008. Predicting the effect of climate change on wildfire behavior and initial attack success. *Climatic Change* 87:251-264. 10.1007/s10584-007-9360-2
- Marín-Spiotta*, E., C.W. Swanston, M.S. Torn, W.L. Silver, and S.D. Burton. 2008. Chemical and mineral control of soil carbon turnover in reforested pastures. *Geoderma*, 143:49-62.
- Fischer, M.L., Billesbach, D.P., Riley, W.J., Berry, J.A., and M.S. Torn. 2007. Spatiotemporal variations in growing season exchanges of CO₂, H₂O, and sensible heat in agricultural fields of the Southern Great Plains. *Earth Interactions*, Vol 11, Paper 17, 21 pp
- Berhe*, A.A., J. Harte, J.W. Harden, and M.S. Torn. 2007. The significance of the erosion-induced terrestrial carbon sink. *Bioscience* 57(4): 337-346.
- Bird*, J.A. and M.S. Torn. 2006. Fine Roots versus Needles: A Comparison of ¹³C and ¹⁵N dynamics in a ponderosa pine forest soil. *Biogeochemistry* 79(3):53-67, DOI 10.1007/s10533-005-5632
- Joslin, J.D., J.B. Gaudinski*, M.S. Torn, W.J. Riley, and P.J. Hanson. 2006. Unearthing live fine root turnover times in a hardwood forest: the roles of root diameter, soil depth, and root branching order. *New Phytologist* 172: 523-535
- Torn, M.S. and J. Harte. 2006. Missing feedbacks, asymmetric uncertainties, and the underestimation of future warming. *Geophys. Res. Lett.*, 33, L10703, doi:10.1029/2005GL025540.
- Treseder, K.K. , M.S. Torn, C.A. Masiello*. 2006. An ecosystem-scale radiocarbon tracer to test use of litter carbon by ectomycorrhizal fungi. *Soil Biology and Biochemistry* 38(5): 1077-1082
- Mikutta*, R. M. Kleber, M.S. Torn, and R. Jahn. 2006. Stabilization of soil organic matter: association with minerals or chemical recalcitrance? *Biogeochemistry* 77:25-56
- Rasmussen*, C, M.S. Torn, and R.J. Southard. 2005. Soil mineral assemblage and aggregates control soil carbon dynamics in a California conifer forest. Published online 29 September 2005; doi:10.2136/sssaj2005.0040 *Soil Sci Soc Am J* 2005 69:1711-1721.
- Kleber, M, R. *Mikutta, M.S. Torn, and R. Jahn. 2005. Poorly-crystalline mineral phases protect organic matter in acid subsoil horizons. *European Journal of Soil Science* 56:717–725.

- Torn, M.S., P.M. Vitousek, and S.E. Trumbore. 2005. The influence of nutrient availability on soil organic matter turnover estimated by incubations and radiocarbon modeling. *Ecosystems* 8: 352-372.
- Swanston*, C.W., M.S. Torn, P.J. Hanson, J.R. Southon, C.T. Garten, E.M. *Hanlon, L. Ganio. 2005. Characterizing processes of soil carbon stabilization using forest stand-level radiocarbon enrichment. *Geoderma* 128:52–62.
- Cooley*, H.S., W.J. Riley, M.S. Torn, and Y. He. 2005. Impact of agricultural practice on regional climate in a coupled land surface mesoscale model. *JGR-Atmospheres* v110, D03113.
- Masiello*, C.A., O.A. Chadwick, J. Southon, M.S. Torn, and J.W. Harden. 2004. Mechanisms of carbon storage in grassland soils. *Global Biogeochemical Cycles* 18(4): GB4023
10.1029/2004GB002219
- Fried, J.S., M.S. Torn, and E. Mills. 2004. The impact of climate change on wildfire severity: a regional forecast for Northern California. *Climatic Change*, 64 (1-2): 169-191
- Billesbach, D.P., M.L. Fischer, M.S. Torn, and J.A. Berry. 2004. A portable eddy covariance system for the measurement of ecosystem-atmosphere exchange of CO₂, water vapor, and energy, *The Journal of Atmospheric and Oceanic Technology*, 21: 684-695
- Lapenis, A.G., G.B. Lawrence, A.A. Andreev, A.A. Bobrov M.S. Torn, J.W. Harden. 2004. Acidification of forest soil in Russia: 1893-present. *Global Biogeochemical Cycles*, 18 (1): GB1037
- Torn, M.S., S. Davis, J.A. Bird, M.R. Shaw, M.E Conrad. 2003. Automated analysis of ¹³C/¹²C ratios in CO₂ and dissolved inorganic carbon for ecological and environmental applications. *Rapid Communications in Mass Spectrometry* 17(23):2675-2682
- Kahle*, M., M. Kleber, M.S. Torn and R. Jahn. 2003. Carbon storage in coarse and fine clay fractions of illitic soils. *Soil Science Society of America Journal*, 67:1732-1739.
- Riley, W.J., C.J. Still, M.S. Torn, and J.A. Berry. 2002. A mechanistic model of H₂¹⁸O and C¹⁸OO fluxes between ecosystems and the atmosphere: Model description and sensitivity analyses. *Global Biogeochemical Cycles*, 16, 1095-1109.
- Torn, M.S., Lapenis, A.G., Timofeev, A. Fischer, M., Babikov, I., Harden, J. 2002. Organic carbon and carbon isotopes in modern and 100-year-old soil archives of the Russian steppe. *Global Change Biology*, 8:941-953.
- Torn, M.S. and J. Southon. 2001. A new ¹³C correction for radiocarbon samples from elevated-CO₂ Experiments. *Radiocarbon*, 43: 691-694.
- Rillig, M.C., S.F. Wright, K.A. Nichols, W.F. Schmidt, and M.S. Torn. 2001. Large contribution of arbuscular mycorrhizal fungi to soil carbon pools in tropical forest soils. *Plant and Soil*, 233(2): 167-177.
- Lapenis, A.G., M.S.Torn, J.W. Harden, K. Hollocher, B.V. Babikov, A.I. Timofeev, M.I. Hornberger, R. Nattis. 2000. Scientists unearth clues to soil contamination by comparing old and new soil samples, *EOS* 81(7): 55-57.
- Saleska, S.R., J. Harte, and M.S. Torn. 1999. The effect of experimental ecosystem warming on CO₂ fluxes in a montane meadow. *Global Change Biology* 5:125-141.
- Torn, M.S., S.E. Trumbore, O.A. Chadwick, P.M. Vitousek, and D.M. Hendricks. 1997. Mineral control over soil carbon storage and turnover. *Nature* 389:170-173.
- Chapin III, F.S., M.S. Torn and M. Tateno. 1996. Principles of ecosystem sustainability. *American Naturalist* 148(6): 1016-1037.

- Torn, M.S. and J. Harte. 1996. Methane consumption by montane soils: implications for positive and negative feedback with climatic change. *Biogeochemistry* 32: 53-67.
- Harte, J., M.S. Torn, F. Chang, B. Feifarek, A. Kinzig, M.R. Shaw, and K. Shen. 1995. Results from a global warming experiment: Soil temperature and moisture responses in a subalpine meadow ecosystem. *Ecological Applications* 5(1): 132-150.
- Torn, M.S. and F.S. Chapin III. 1993. Environmental and biotic controls over methane flux from arctic tundra. *Chemosphere* 26 (1-4): 357-368.
- Torn, M.S. and J.S. Fried. 1992. Predicting the impact of global warming on wildfire. *Climatic Change* 21: 257-274.
- Fried, J.S. and M.S. Torn. 1990. Analyzing localized climate impacts with the Changed Climate Fire Modeling System. *Natural Resource Modeling* 4(2): 229-253.

Manuscripts Submitted (* indicates graduate student or post doc)

- W.J. Riley, S.C. Biraud, M.S. Torn, M.L. Fischer, D.P. Billesbach, J.A. Berry, Regional CO₂ and Latent Heat Surface Fluxes in the Southern Great Plains: Measurements, Modeling, and Scaling, submitted to JGR-Biogeosciences (2009)
- Xiao, Jingfeng, Q. Zhuang, D.D. Baldocchi, B.E. Law, A.D. Richardson, J. Chen, R. Oren, G. Starr, A. Noormets, S. Ma, S.B. Verma, S. Wharton, S.C. Wofsy, P.V. Bolstad, S.P. Burns, D.R. Cook, P.S. Curtis, B.G. Drake, M. Falk, M.L. Fischer, D.R. Foster, L. Gu, J.L. Hadley, D.Y. Hollinger, G.G. Katul, M. Litvak, T.A. Martin, R. Matamala, S. McNulty, T.P. Meyers, R.K. Monson, J.W. Munger, W.C. Oechel, K.T. Paw U, H.P. Schmid, R.L. Scott, G. Sun, A.E. Suker, M.S. Torn. 2008. Estimation of Net Ecosystem Carbon Exchange for the Conterminous United States by Combining MODIS and AmeriFlux Data. *Recent Net Ecosystem Carbon Exchange of U.S. Terrestrial Ecosystems. Submitted to: PNAS Tracking #: 2009-01428*
- Cusack*, D.F., W. Silver, M.S. Torn, and W. H. McDowell. Effects of nitrogen deposition on above- and belowground carbon dynamics in two tropical forests. Submitted to Ecology.
- Berhe*, A.A., J.W. Harden, M.S. Torn, M. Kleber, S.D. Burton, and J. Harte. Role of Mineral Matrix and Molecular Architecture in Stabilization of Soil Organic Matter in Eroding and Depositional Landform Positions. Submitted to Soil Biology and Biochemistry
- Cusack*, D.F., M.S. Torn, W. H. McDowell, and W. Silver. The Response of Heterotrophic Activity and Carbon Cycling to Nitrogen Additions and Warming in Two Tropical Soils. Submitted to Global Change Biology.
- Sudderth*, E.A., S.B. St.Clair, R. Salve, M.L. Fischer, M. Kleber, E.B. Sudderth, M.S. Torn, D.D. Ackerly. Grassland response to global change: Soil type controls the impact of altered precipitation pattern on ecosystem function in *Avena barbata* grasslands. Submitted to Ecology Letters.

Books and Book Chapters

- Torn, M.S., C.W. Swanston, C. Castanha, S.E. Trumbore. Storage and turnover of natural organic matter in soil. In: IUPAC Series on Biophysico-chemical Processes in Environmental Systems; Volume 2-Biophysico-chemical processes involving natural nonliving organic matter in environmental systems. Series Editors: P. M. Huang and N. Senesi. *In press. LBNL-810E*
- Trumbore, S.E. and M.S. Torn. Soils and the global carbon cycle. 2005. In: Soils and Global Change, EA Holland, ed. NATO Advanced Study Institute, http://esd.lbl.gov/ESD_staff/torn/nato_soilcarbon.pdf

- Jensen, D.B., M.S. Torn, and J. Harte. 1993. In *Our Own Hands: A Strategy for Conserving California's Biological Diversity*, University of California Press, Los Angeles. 290 pp.
- Harte, J., M.S. Torn, and D.B. Jensen. 1992. The nature and consequences of indirect linkages between climate change and biological diversity. In: *Global Warming and Biological Diversity*, R.L. Peters and T.E. Lovejoy, eds. Yale University Press, New Haven. pp. 325-343.

Selected Non-Refereed Publications

- Kerr, A. and M.S. Torn. 2008. *Greenhouse Gas Inventory Methods. A report for the Climate Change Research Plan Update*, California Energy Commission.
- Kueppers, L., M.S. Torn, and J. Harte. 2007. *Quantifying ecosystem feedbacks to climate change: observational needs and priorities. A report to the Office of Biological and Environmental Research*, DOE.
- Fried, J.S., J.K. Gilles, W.J. Riley, T.J. Moody, C. Simon de Blas, K. Hayhoe, M. Moritz, S. Stephens, M.S. Torn. 2006. Predicting the effect of climate change on wildfire severity and outcomes in California: Preliminary analysis. For: *California Climate Change: Science Report to Governor on Impacts and Adaptation Options*.
- Trumbore, S.E. and M.S. Torn. *Soils and the Global Carbon Cycle*. 2005. In: *Soils and Global Change*, EA Holland, ed. NATO Advanced Study Institute, LBNL-44910, 2005.
http://esd.lbl.gov/ESD_staff/torn/nato_soilcarbon.pdf
- Denning, S., R. B. Cook, L. Dilling, L. Heath, D. McGuire, B. McKee C. Sabine, R. Oren, K. Paustian, J. Randerson, J. Reilly, S. Running, R. Stallard, M.S. Torn, S. Wofsy. 2005. *Interagency Science Implementation Strategy for the North American Carbon Program. Report of the U.S. Interagency Carbon Cycle Science Program*. Washington, DC: US Global Change Research Program.
- Farrell, A.E., A.C. Kerr, A.R. Brandt, M.S. Torn, and G. Franco. 2004. *Research Roadmap for Greenhouse Gas Inventory Methods. Prepared for the California Energy Commission PIER (Public Interest Energy Research) program*.
- Hanneman, M. and M.S. Torn. 2003. Review Chapter. In: *Global Climate Change and California: Potential Implications for Ecosystems, Health, and Economy*. California Energy Commission.
- Torn, M.S., C. Masiello, I. Basile-Doelsch, N. Bijoor, and R. Sutton. 2002. Mineral control of carbon storage in Andisols: Case studies and applications to other soils. In: Kleber, M., P. Bartoli, and O. Arnalds. *Mineralogy related features and processes common to European Andosols*. COST ACTION 622: "Soil Resources of European Volcanic Systems" Manderscheid, Germany, April 24-28, 2002. (conference proceedings). LBNL-53797 Ext. Abs.
- Hedin, L. O. Chadwick, J. Schimel, M. Torn, and workshop participants. 2002. *Linking Ecological Biology and Geoscience. Report to the National Science Foundation April 4, 2002. Workshop held at the Annual meeting of the Ecological Society of America, August 4-5 2001, Madison, Wisconsin*
- Barnes, F.J., S.M. Benson, and M.S. Torn, co-chairs. 2002. *DOE Water Cycle Research Strategy. December 2001. U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research. DOE-SC-0043*.
- Berner, R. and workshop participants. 2001. *The Changing Carbon Cycle: A Terrestrial Focus. Report of the Workshop on the Terrestrial Carbon Cycle. Sponsored by The National Science Foundation, Division of Earth Sciences, June 3, 2000. Workshop Participants: Michael Bender, Robert Berner, Katherine H. Freeman, Chris Field, James Galloway, John Hedges, Lars O. Hedin, Fred Mackenzie, Claudia Mora, Joshua Schimel, William Schlesinger, Robert Stallard, Eric Sundquist, Margaret Torn, Steven C. Wofsy*.

- Billesbach, D.P., M.L. Fischer, J.A. Berry and M.S. Torn (2001) A highly portable, rapidly deployable system for eddy covariance measurements of CO₂ fluxes. LBNL Report. LBNL-48953.
- Torn, M.S., E. Mills, and J.S. Fried. 1999. Will climate change spark more wildfire damage? Contingencies: American Academy of Actuaries. July/August p. 34-43. LBNL Report No. 42592.
- Torn, M.S. 1994. Environmental Controls over Methane Flux from Ecosystems and the Potential for Feedbacks with Climatic Change. Ph.D. Dissertation, University of California, Berkeley.
- Torn, M.S. 1993. Global Warming and Upwelling Ecosystems. In: California Sea Grant: Biennial Report of Completed Projects, 1988-1990. California Sea Grant College, U.C. San Diego.
- Jensen, D.B., M.S. Torn, and J. Harte. 1991. In Our Own Hands: A strategy for conserving biological diversity in California. California Policy Seminar, Berkeley, CA. 220 pp.
- Torn, M.S. 1990. The Threats to Biological Diversity in California. Masters Thesis, Energy and Resources Group, U.C. Berkeley. 65 pp.
- Torn, M.S., J.E. DeGrange, and J.H. Shinn. 1988. The Effects of Acidic Deposition on Alberta Agriculture: A review. Acid Deposition Research Program. Calgary, Alberta. 160 pp.

Selected Synergistic and Professional Activities, 1999-2009

- Service to Berkeley Lab and UC Berkeley: Chair of the Earth Sciences Division diversity committee, 2003-2006; member of ESD Division Council (2001-present) and UCB ERG Executive Committee (2003-2005 as affiliate; 2006-present as core member).
- Planning meeting, the Carbon Summit, National Academies, January 28-29, 2009.
- Science Steering Group*, National Soil Carbon Network, 2008-present
- Science Steering Group*, North American Carbon Program (NACP), 2005-present
- Convened workshop for Energy Biosciences Institute (EBI) on research needs for biologically enhanced carbon sequestration in terrestrial and geologic reservoirs. Co-convenor: Curt Oldenburg. Berkeley, October 29, 2007. Co-author of whitepaper to EBI.
- Workshop participant, Exploring science needs for the next generation of climatic change and elevated CO₂ experiments in terrestrial ecosystems, Washington DC, April 14-18, 2008.
- Rapporteur*, Gradients and Transects session, NACP PI meeting, January 25, 2007.
- Co-Chair, Continental Synthesis Task Force*, Science Steering Group, (NACP), 2005
- Testified for California Air Resources Board to US EPA hearing on AB32 waiver, May 30, 2007
- Organizing committee and session chair*, China-US Climate Change Conference, Berkeley, CA, May 2006.
- Contributing writer and reviewer*, California Climate Change: Science Report to Governor on Impacts and Adaptation Options. Convened by California Energy Commission, EPA, and ARB.
- Program Reviewer*, Carbon Dioxide Information Analysis Center (CDIAC), 2005
- Co-convenor and Co-chair*, AGU sessions (oral and poster): Carbon, Water, and Energy Exchange in Grassland and Cropland Ecosystems, Fall Meeting 2004. Modeling and observation of ecosystem, carbon cycle and energy system feedbacks in the Earth's climate, Fall Meeting 2006. Soils: Mechanisms of Carbon Stabilization and Response to Climate Change II, Fall Meeting 2007
- National Technical Advisory Committee*, DOE National Institute for Global Environmental Change, 2003-2005
- Science advisor*, Union of Concerned Scientists assessment of climate change and wildfire impacts in California, 2005
- Invited participant and rapporteur*, NSF NEON Biogeochemistry Workshop, Boulder, July 2004
- Invited participant*, Interagency workshop on Ecosystem Chapter of the US Climate Change Science Plan, Spring, 2004.
- Session leader*, NSF-sponsored workshop on soil respiration: Carbon Respiration from Terrestrial Ecosystems (CaRTE). 2004

Writing Team, Rapporteur, North American Carbon Program workshop & implementation plan, 2003
Co-Author, Review Chapter of California Energy Commission Climate Change Assessment, 2003
Lead Author, Road map for non-CO₂ greenhouse gas inventories in California, California Energy Commission. 2003-2004
Co-chair and author, DOE Water Cycle Dynamics and Prediction Program plan, 2001
Co-organizer NSF workshop for research in joint geosciences and biosciences. Madison, WI, 2001.
Co-author, white paper on Biogeosciences in NSF. White Paper title “Linking Ecological Biology and Geoscience. Report to the National Science Foundation, April 4, 2002.”
Co-author NSF workshop on the Terrestrial Carbon Cycle, June 2000. White Paper title: “The changing carbon cycle: A terrestrial focus,”
Co-author DOE Terrestrial Ecosystems Research Facilities white paper, 2000.
Invited Panelist California Energy Commission Workshop on Climate Change Science, June 1999.
Co-author Agricultural and grassland ecosystems, appendix to “Working paper on carbon sequestration science and technology,” Office of Science and Office of Fossil Energy, DOE 1999
Guest Instructor workshop on “Monitoring, Evaluation, Reporting, Verification and Certification of CO₂ Emissions,” LBNL Energy and Environmental Technologies Division, 2000.
Interviewer, Switzer Environmental Fellowship
Interviewer, Compton Foundation Fellowship
Reviewer *Atmospheric Environment, Biogeochemistry, Chemosphere, Climatic Change, Ecological Applications, Geoderma, Global Biogeochemical Cycles, Global Change Biology, Journal of Geophysical Research, Limnology and Oceanography, Nature, Oecologia, Soil Science Society of America Journal*
Proposal Reviewer DOE, NSF, WESTGEC, EPA
Proposal Panel Member DOE-TCP, DOE-NICCR
Mentor, ERULF, SULI, GREF, Pre-teacher training, and Mickey Leland programs.

Courses Taught

Food Systems (Energy and Resources 298), University of California, Berkeley, Fall 2008, Spring 2009
 Climate Change Impacts and Adaptation (Energy and Resources 290), University of California, Berkeley, Fall 2007, Fall 2008
 Environmental Aspects of Biofuels (Energy and Resources 290N) University of California, Berkeley, Spring 2007.
 Quantitative Aspects of Global Environmental Problems (Energy and Resources 102) University of California, Berkeley, Spring 2006, Spring 2009 (co-taught).
 The Root-Ecosystem Interface. Co-taught with Todd Dawson. Department of Integrative Biology, University of California, Berkeley. Spring 2002. Course number: IB 250.
 Biogeochemistry: Carbon and Nitrogen Cycles (Environmental Science 320), Colorado College, Spring 1996. (*Visiting Professor*)

Other Teaching Experience

Guest Lecturer at UCB, ER201, November 2006, 2007; PH268 February 2008
Guest Lecturer, Monterey Institute of International Studies, February 2008, October 2008
Lecturer Environmental and Cultural Aspects of Energy, Workshop for Native American College
Instructor, Native American Renewable Energy Education Project, Summer 1996.
Teaching Assistant Quantitative Aspects of Global Environmental Problems (Energy and Resources 102) University of California, Berkeley, Spring 1987.
Guest Lecturer UC Berkeley, UC Irvine, LBNL, 1991-1994, 1995, 1999-2000
Guest Lecturer Stanford University, 1999

Guest Instructor, workshop on “Monitoring, Evaluation, Reporting, Verification and Certification of CO₂ Emissions” organized by Ed Vine, LBNL Energy and Environmental Technologies Division, 2000.

Invited Presentations, 1999-2008 (more than 100 presentations given or co-authored during period):

The Direct Effects of land use and land cover change for Biofuels. Workshop on Measuring and Modeling the Lifecycle GHG Impacts of Transportation Fuels. EDF-ERG-EBI. Berkeley, CA, July 1-2, 2008.

Effects of erosion on CO₂ and N₂O fluxes accompanying land use change. Greenhouse Gas Emissions from Biofuels Workshop, Berkeley, CA, June 9-10, 2008. Sponsored by EBI.

Mission and Discovery: Big Science and Little Science at a National Laboratory. Invited talk for the German-American Conference on Organization, Research Management, and Science Policy, How Do We Know What We Know about Climate Change? University of California, Berkeley, April 24-26, 2008.

CLASIC Carbon Air. The CLASIC workshop. March 26-27, Norman, Oklahoma.

Ecosystem feedbacks in the climate system and the role of soils. Environmental Engineering Seminar, University of California, Berkeley, February 29, 2008.

Linking the Response of Annual Grasslands to Warming and Altered Rainfall Across Scales of Gene Expression, Species, and Ecosystem, invited presentation at AGU Fall Meeting, San Francisco, CA, December 14 2007.

Annual Grassland Response to Altered Precipitation and Temperature: genes, species, and ecosystem, invited talk in “Ecosystem responses to experimental warming and other global climate change factors,” Ecological Society of America annual meeting, San Jose, CA, August 8, 2007.

Isotope research opportunities, FACE Workshop, Oak Ridge, TN, June 6, 2007.

Ecosystem-Climate Interactions, Poster and flash slide presentation, German American Frontiers of Science, Kavli Frontiers of Science, National Academy of Sciences, Irvine, CA, June 1, 2007.

Speaker at Earth Day rally on Sproul Plaza, UC Berkeley, April 20, 2007.

Belowground Carbon Cycling and Root Modeling, Enriched Background Isotope Study workshop, New Orleans, LA, April 12, 2007.

Climate Change: In your lifetime. Presented to the American Junior Academy of Sciences, Lawrence Berkeley National Laboratory, February 15, 2007.

The Risk of Climate Change: What it Means for California. First Friday Forum, Lafayette, California February 2, 2007

Asymmetries in Climate Change Feedbacks: Why the Future may be Hotter Than you Think. AGU Fall Meeting, San Francisco, CA, December 12, 2006.

Climate Change: Facing the Impacts Now. Santa Rosa Jr College, Arts and Lectures Series. Santa Rosa, CA, October 11, 2006.

Climate Change Feedbacks and the Future Role of Soils. USGS Western Colloquium. Menlo Park, CA, August 14, 2006

Local Impacts of Global Warming, Presented to representatives from Alameda county and all its cities for the ICLEI Alameda Kickoff, Berkeley, CA, June 15, 2006

Next Generation Soil Carbon Models: Lessons from Isotopic Studies. Keynote address for the German Soil Priority Program 1090, Mechanisms of Soil Organic Matter Stabilization. Thurnau, Germany, March 21, 2006.

Are roots the source of all soil organic matter? Results from isotopic experiments in two temperate forests, AGU Fall meeting, San Francisco, 2005

From Mechanisms to Models. Final talk for the Second International Conference on Mechanisms of Soil Organic Matter Stabilization. Asilomar, CA, October 13, 2006.

TCP Soil Carbon Research, for the DOE/BER Carbon Cycle Research Review, Washington DC, Oct 4-6 2006, with contributions from J. Jastrow, R. Matamala, E. Paul, S. Morris, C. Garten, and P. Hanson.

Regional Analysis: ARM, for the DOE/BER Carbon Cycle Research Review, Washington DC, Oct 4-6 2006.

Women in Science. Panel discussion for Girls, Inc Alameda, Women of the 21st Century Club. Alameda, CA, July 19, 2005.

An Annual Grassland Exploration of Scaling from Genomes to Ecosystem Function. Program for Ecosystem Research Workshop, Flagstaff, AZ, April 12, 2005

Climate-Ecosystem Feedbacks: Observational Needs and Opportunities: A scoping project for the US Climate Change Science Program. Program for Ecosystem Research Workshop, Flagstaff, AZ, April 12, 2005

EBIS Microbial Carbon Cycling rates and substrates. Enriched Background Isotope Study Workshop, Livermore, CA, January 20, 2005.

Modeling wildfire and changing climates. Fire Ecology Seminar. University of California, Berkeley. September 2004.

Soil Carbon Dynamics in Two Novel Cases: The Historic Russian Archives and the Tennessee Burp. Informal Seminar. University of Zurich, Switzerland. May 2004.

Climate Change: Bringing it Back Home. Berkeley Lab Friends of Science Lecture Series. Berkeley City Main Library, April 26, 2004.

Biotic and biogeochemical feedbacks to climate change. AGU fall meeting, San Francisco, CA, December 2002. Presented by John Harte.

Mineral control of carbon storage in Andisols: Case studies and applications to other soils. European Union workshop. COST ACTION 622: "Soil Resources of European Volcanic Systems" Manderscheid, Germany, April 24-28, 2002. *Keynote address.

Applications of Radiocarbon to Terrestrial Carbon Research. Martin Luther University, April 30, 2002, Halle, Germany.

Quantifying the Importance of Belowground Plant Allocation for Sequestration of Carbon in Soil. DOE Science Team Meeting, Argonne National Laboratory, IL. October 29-31, 2001

Historic Russian Soil Collection Soil Carbon in the Russian Steppe. Workshop on Mechanisms of Soil Carbon Storage, UC Santa Barbara, December 3-4, 2001.

Using ¹³C and ¹⁴C in Elevated CO₂ Experiments to Understand Soil Carbon Cycling in Grasslands. Workshop on Mechanisms of Soil Carbon Storage, UC Santa Barbara, December 3-4, 2001.

Using ¹³C and ¹⁴C in Elevated CO₂ Experiments to Understand Soil Carbon Cycling and Microbial Activity in Grassland. Isotopes in Ecology and the Earth Sciences at UC Berkeley; Berkeley Center for Stable Isotope Biogeochemistry, Berkeley, CA, August 2000.

Ecological Complexity and Climate Change; California Energy Commission Workshop on Climate Change Science, Sacramento, CA, June 1999.

Mineral Control of Soil Organic Matter Storage and Turnover. Center For Accelerator Mass Spectrometry Seminar Series, Lawrence Berkeley National Laboratory, 1999.

Current Grants, Principal Investigator:

Carbon Cycle Measurements and Analysis for the DOE Atmospheric Radiation Measurement Program. DOE BER. FY 2003-2009.

Quantifying the Importance of Belowground Plant Allocation for Sequestration of Carbon in Soils. DOE BER. FY 2000-2009. Co-PI Todd Dawson, UCB.

Characterizing Organic Carbon Flux from Litter Sources to Mineral-Soil Sinks. Enriched Background Isotope Study (EBIS)-AmeriFlux. DOE BER FY2007-2010.

DOE Early Career Award for Scientists and Engineers, DOE BER FY2005-2009

Current Grants, Co-Investigator

Life-cycle Environmental and Economic Decision-Making for Alternative Biofuels. An Energy Biosciences Institute (EBI) Program. PIs Arpad Horvath and Tom McKone. 2007-2010.

An Annual Grassland Mesocosm Exploration of Scaling From Genomes to Ecosystem Function, DOE BER FY2005-2009. PI Mary Firestone, LBL/UCB.

An Integrated Terrestrial Carbon Model (ITCM) for North America: Constraining Process Models with Experiments and Measurements for Analysis and Projection. DOE BER FY08-11. PI Mac Post, Oak Ridge National Laboratory.

Subalpine and alpine species range shifts with climate change: temperature and soil moisture manipulations to test species and population responses. DOE BER 2007-2011. PI Lara Kueppers, UC Merced.

Past Grants.

DOE BER. Characterizing Organic Carbon Flux from Litter Sources to Mineral-Soil Sinks, FY2007.

DOE BER Climate-Ecosystem Feedbacks: Observational Needs and Opportunities, FY 2004-2006

USFS Soil Carbon Decomposition Along Paired Pine and Hardwood Climosequences, FY07.

LLNL. Carbon Flux in a California Grassland Soil Sequence FY2004-2006

USDA. Dynamics of buried soil organic carbon along a depositional toposequence, 2003-06. PI Harte

DOE BER Enriched Background Isotope Study (EBIS), FY 2001-2006

NSF Controls on the Storage and Loss of Soil Organic Carbon with Reforestation of Abandoned Pastures, FY 2001-2005. PI Whendee Silver

California Energy Commission, non-CO₂ greenhouse gases. FY2003-2004. PI Farrell.

University of Martin Luther, Germany, fluoride reactivity of minerals, FY 2003-2005

Laboratory Director Long-Term Development, LBNL 2001-2003

Laboratory Director Long-Term Development, LBNL 1999-2001

DOE Water Cycle Pilot

DOE Terrestrial Carbon Program, 1999-2000

National Science Foundation, 1996-1998

University-wide Energy Research Group Grant, 1990

California Policy Seminar Grant, 1987-1989

California Sea Grant Trainee (Scripps Oceanographic Institute), 1989

Climatic Change Effects Research Program Grant, US EPA, 1988

Council on Educational Development, Course Improvement Grant, 1987

Postdoctoral Research Advisors:

Susan Trumbore, Peter Vitousek, Chris Field

Thesis Advisors:

John Harte, F. Stuart Chapin, III, Pamela Matson, John Holdren

Postdoctoral Research Associates:

Jeff Bird, Julia Gaudinski, Simon Davis, Caroline Masiello, Chris Swanston, Lara Kueppers, Karis McFarlane

Serve(d) as reader, mentor, and/or collaborator for graduate students:

Asmeret Asefaw Behre, Danielle Svelha Christianson, Daniela Cusack, Kevin Fingerma, Karen Hammes (University of Zurich), Maren Kahle (Martin Luther University, FRG), Andy Jones,

Amber Kerr, Laurie Koteen, Lara Kueppers, Federico Maggi, Karis McFarlane (Lawrence Livermore National Lab), Anna Motschenbacher, Rich Plevin, Erika Marin-Spiotta (DOE GREF Mentor), Rebecca Sutton, Craig Rasmussen (UC Davis), Bettina Weibel (University Zurich), Zack Subin, Erika Zavaleta (Stanford), John Zobitz (DOE GREF Mentor).

Mentored Undergraduate, High School, and Teacher Interns (with name of Mentorship Program), in chronological order:

Diane Kenski (ERULF), Pallavi Shukla (Mickey Leland), Erin Hanlon (Science Undergraduate Laboratory Internship, SULI), Braulia Sapien (Pre-Service Teacher Training, PST), Laura Wells (PST), Laura Huppert (Piedmont High School; Winner, Regional Science Fair and Intel International Science Fair in March 2005 with our project); Francesca Mia Hopkins (Environmental Science Senior Thesis, UCB; then Earth Sciences Division post baccalaureate fellow), Amy Morris (PST); Ryan Smith (PST); Alec Boyd; Chris Denn; Rachel Porras (SULI); Lynn Murphy (DOE Academy for Creating Teacher Scientists); Palermo Cuartero (Community College Initiative, CCI), Alfredo Hernandez (Community College Initiative).

Professional Affiliations

American Geophysical Union
Ecological Society of America